KENWOOD

POWER AMPLIFIER

KAC-923
KAC-823

INSTRUCTION MANUAL

KENWOOD CORPORATION

Take the time to read through this instruction manual. Familiarity with installation and operation procedures will help you obtain the best performance from your new power amplifier.

For your records

Record the serial number found on the bottom of the unit in the spaces designated on the warranty card and in the space provided below. Refer to the model and serial numbers whenever you call upon your KENWOOD dealer for information or service on this product.

Model KAC-923/823 Serial number _____

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95/12

SAFETY PRECAUTIONS

⚠ WARNING

Observe the following instructions to prevent fires and personal injury.

- When the Power supply lead, Memory backup lead or Ground lead are extended, use a 5 mm² (AWG 5) or larger automotive grade cable which will withstand friction and heat to safe guard against fires occurring as a result of short-circuiting.
- Make sure that metal objects, particularly needles or coins do not get into the unit to prevent short-circuiting and fires.
- If smoke comes out of the unit or a strange smell is present, disconnect the unit immediately and consult your KENWOOD dealer. Continued use under these circumstances could cause a fire, as well as damage the unit permanently.
- Do not touch the unit during use because the surface of the unit becomes hot and may cause burns if touched.

⚠ CAUTION

Heed the following instructions to keep the unit in proper working order.

- The unit should be connected to a 12 V DC power supply with a minus ground connection.
- Do not open enclosures, such as the front panel, top or bottom covers.
- Do not place the unit, where it will be exposed to direct sunlight or near heating devices.
- Do not expose the unit to water.
- Do not place the unit in areas of excessive dust, high humidity or on unstable surfaces.
- To keep good ventilation, do not anything on top of the unit.

⚠ CAUTION

Before making connections

- Before installing the amplifier, be sure to disconnect the wire from the battery's negative ⊖ terminal to prevent hazards caused by short-circuiting.

Caution on fuse

- When the fuse is blown, first check that the cables are not short-circuited, then replace it with 20 A × 2 (KAC-923), 30 A (KAC-823) fuse.

Caution on RCA cable

- Because RCA cables are more sensitive to external noise than DIN cables, use appropriate consideration when positioning cords.
  If noise occurs, use double-shielded RCA cables.

Cleaning

1. Turn the power off, before cleaning the unit.
2. Wipe the front panel and other exterior surfaces of the unit with a soft dry cloth or a soft cloth lightly moistened with a neutral detergent.

⚠ CAUTION

- Do not use abrasive pads, thinner or benzene (or other volatile solvents) to clean the unit as this may remove indicator characters.

PROCEDURE

■ Procedure

① Before installation and wiring, remove the ⊖ terminal of the battery to prevent short-circuiting.
② Connect the input and output cords of the system. (☞ P. 6)
③ Connect the Ground lead to the metal chassis of the car. (☞ P. 7)
④ Connect the Power supply lead (Red). (☞ P. 7)
⑤ Install the unit in the car. (☞ P. 8)
⑥ Connect the negative ⊖ terminal of the disconnected battery.

⚠ CAUTION

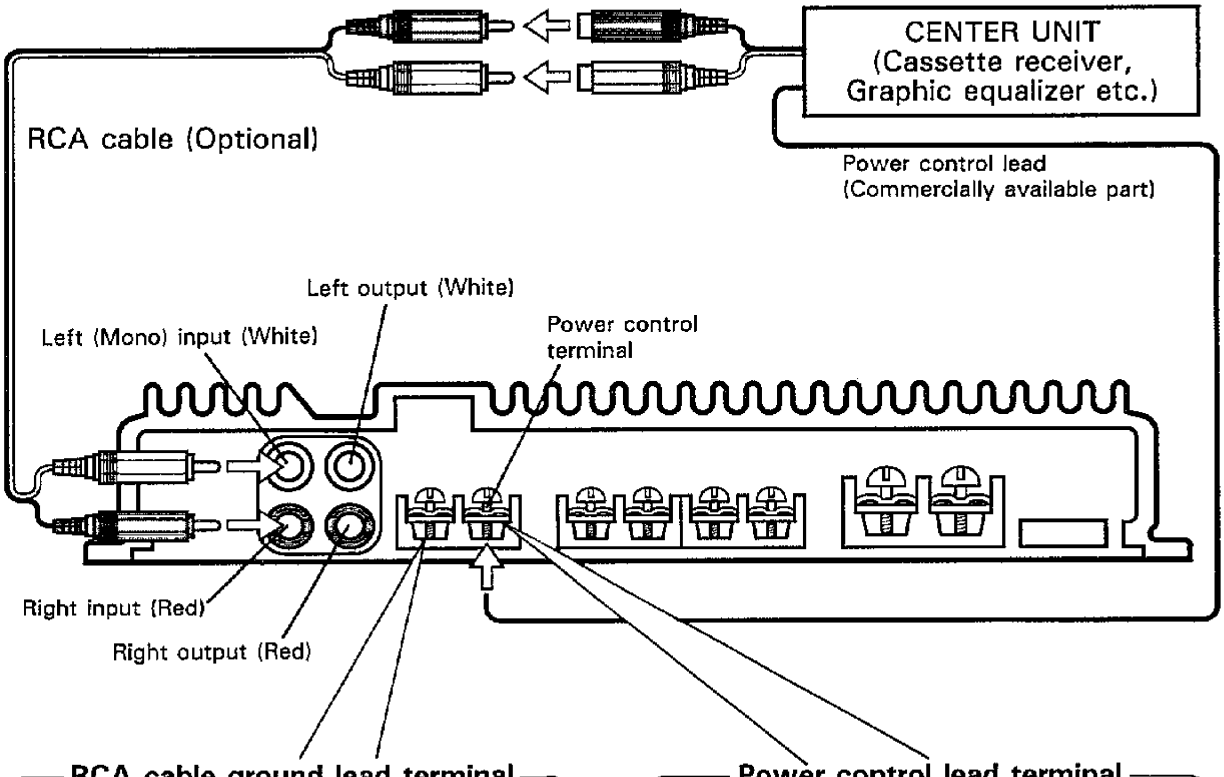
- A short-circuit may be the cause of blown fuse. A short-circuit is a serious problem that can lead to a fire. Check the wiring and rewire if any wires are short-circuited. After this (or if no short-circuits are found), replace the fuse with one having the same capacity (see indication on unit).
- Make sure that unconnected wires and connectors are not in contact with the live chassis (ground) of the car to prevent noise and current from entering the system which can cause it to malfunction or damage the unit. For the same reason, caps on connectors that are not used should not be removed.

■ Accessory

Part name	External view	Number of units
Tapping screws (ϕ5 × 18)		4

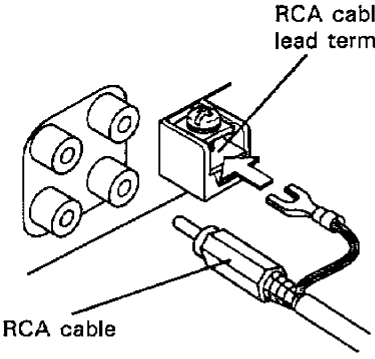
CONNECTIONS

■ System connection



RCA cable ground lead terminal

- When using an RCA cable with a ground lead attached, connect the ground lead to this terminal.

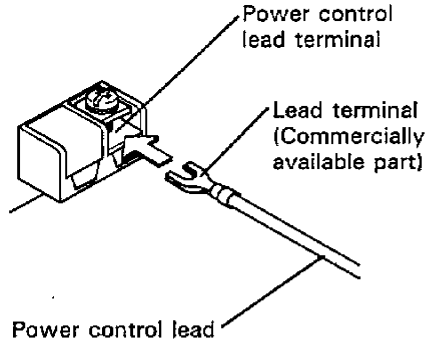


⚠ CAUTION

- Do not use this terminal for power source grounding. This unit will not operate if the power source ground wire is connected to this terminal.

Power control lead terminal

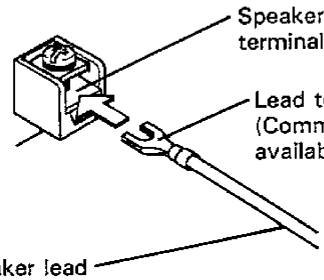
- Connect the center unit's power control lead to this terminal.



■ Speakers and Power lead connection

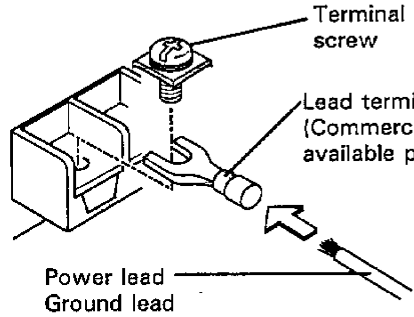
Speaker lead terminals

- Connect the speaker leads to these terminals.

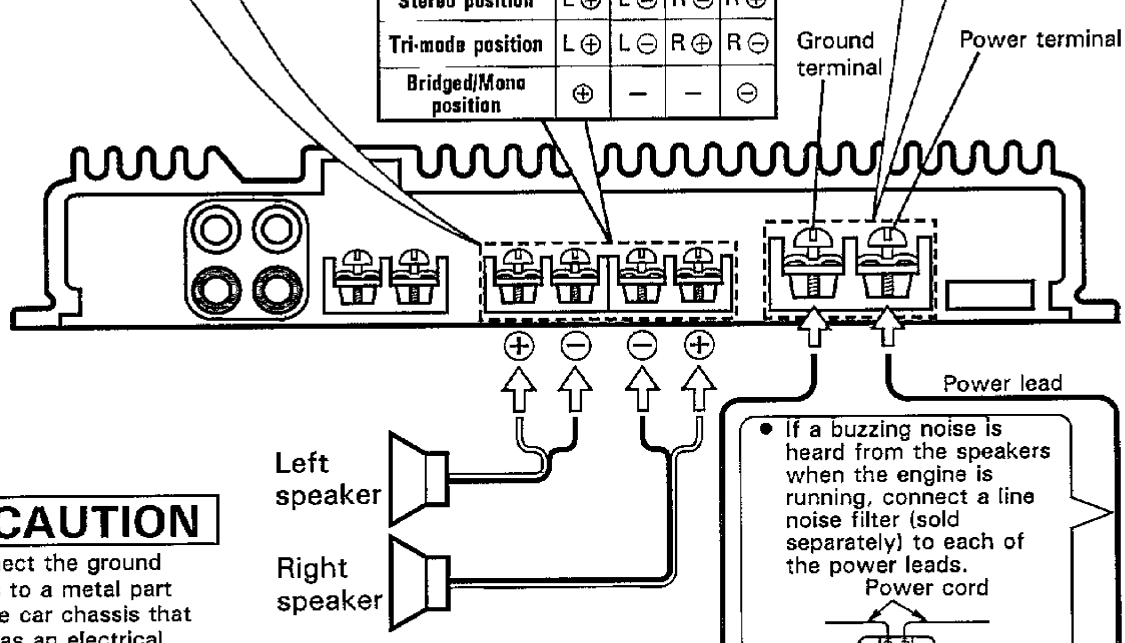


Power lead terminals

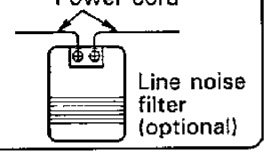
- Connect the power cord and ground cord to the corresponding terminals.



Operation switch	Speaker terminal polarity			
Stereo position	L ⊕	L ⊖	R ⊖	R ⊕
Tri-mode position	L ⊕	L ⊖	R ⊕	R ⊖
Bridged/Mono position	⊕	–	–	⊖



- If a buzzing noise is heard from the speakers when the engine is running, connect a line noise filter (sold separately) to each of the power leads.



⚠ CAUTION

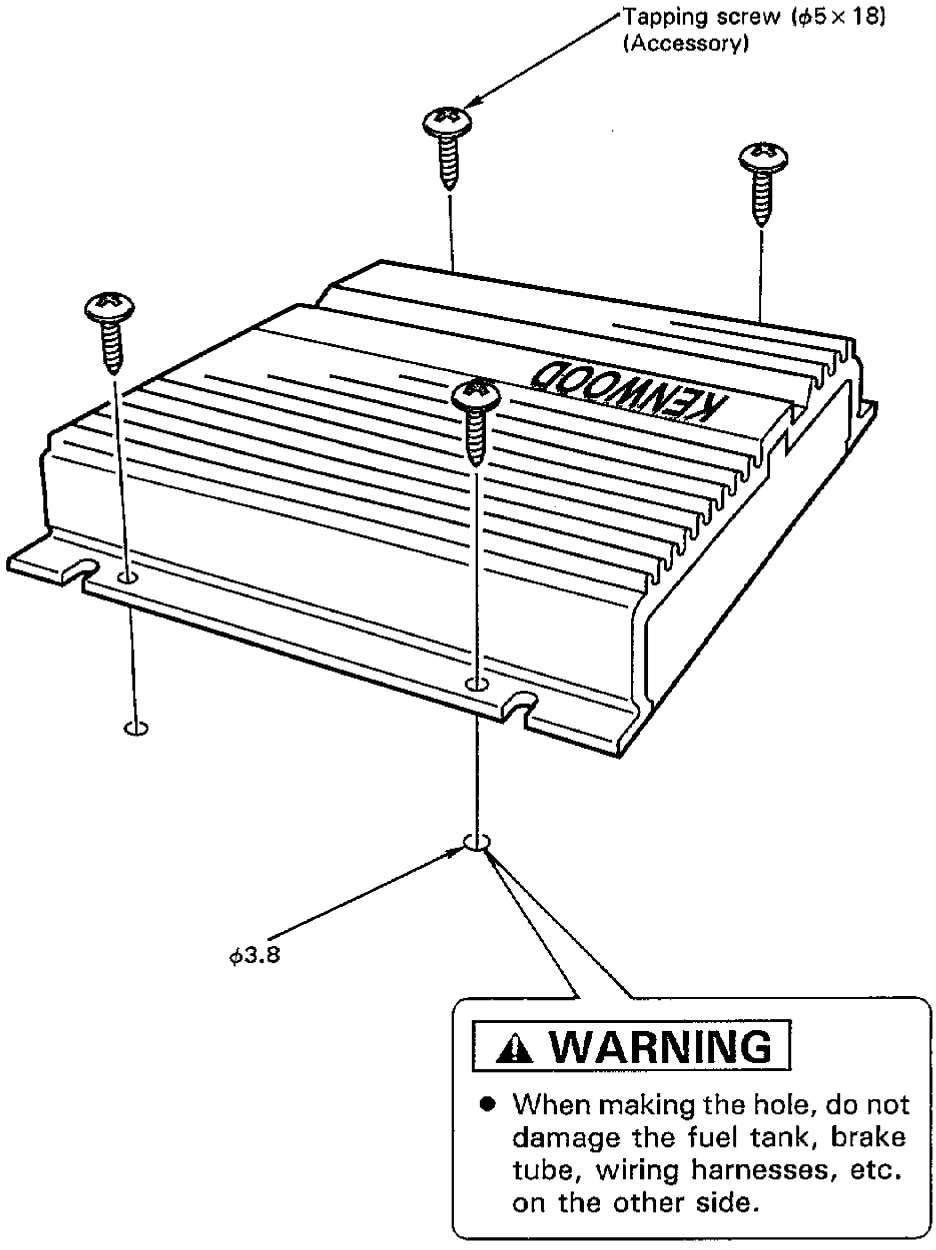
- Connect the ground leads to a metal part of the car chassis that acts as an electrical ground passing electricity to the battery's minus ⊖ terminal.
  Do not turn the power ON if the ground leads are not connected.

⚠ WARNING

- To prevent fire caused by a short in the wiring, connect a fusible link or breaker between the battery and power terminals.

INSTALLATION

■ Installation



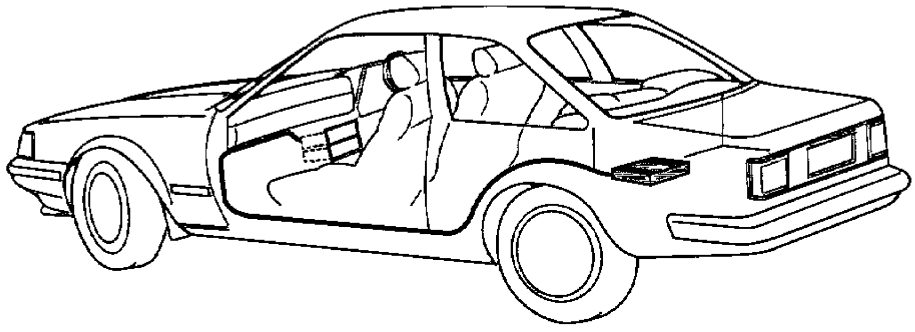
⚠ WARNING

- When making the hole, do not damage the fuel tank, brake tube, wiring harnesses, etc. on the other side.

⚠ WARNING

- Install the unit securely in a location that does not interfere with driving.

■ Installation location



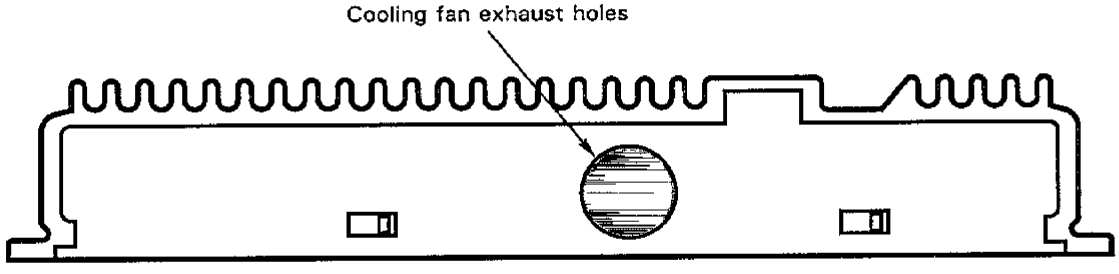
- Since the power amplifier has no parts which require operation, it can be installed at a position away from the driver's seat without any hinderances.
  As generally accepted positions for its installation, places such as inside the trunk, etc. can be considered.
- Use the extension cables. (Optional)

Type \ Length	0.5 m	1 m	2 m	4 m	6 m
RCA	CA-2S	CA-12S	CA-22S	———	———
RCA (ϕ8 mm)	CA-3W	CA-13W	CA-23W	CA-43W	CA-63W
RCA (ϕ12 mm)	CA-5W	CA-15W	CA-25W	CA-45W	CA-65W

⚠ CAUTION

- Install this unit in a location which allows heat to easily dissipate.
  Once installed, do not place any object on top of the unit.

- When the unit's internal temperature rises, the built-in cooling fans automatically operate to cool the unit. When selecting an installation position, be careful that the fan exhaust holes are not blocked so that hot air can be discharged from the unit. If the fan exhaust holes are blocked, cooling operation will be hindered causing the unit to malfunction.



- After installing the unit, check to make sure that electrical equipment such as the brake lamps, turn signal lamps and windshield wipers operate normally.

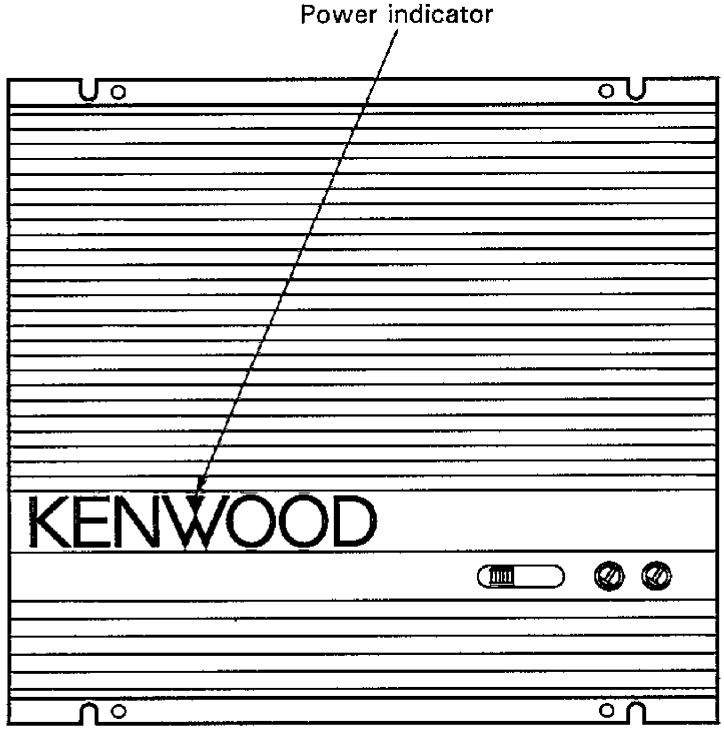
PROTECTION FUNCTION

Protection function

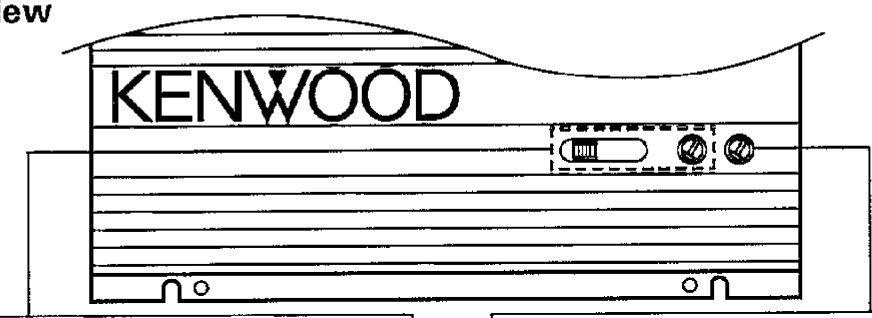
- This unit is equipped with a protection function for protecting this unit and your speakers from various accidents or problems that can occur.
- When the protection function activates, the unit stops operating and the power indicator lights green to indicate that the protection function is activated.

The protection function activates in the following situations:

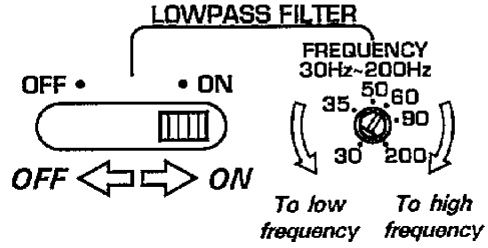
- When a speaker output contacts ground.
- When the unit malfunctions and a DC signal is sent to the speaker outputs.
- When the temperature of internal parts exceeds 120°C (248°F). [When the temperature exceeds 80°C (176°F), the cooling fans operate to cool the unit. However, if the temperature continues to rise regardless of the cooling fan operation, the protection function will activate to shut down the unit.]
- When a ground lead of the center unit (cassette receiver, CD receiver, etc.) or this unit is not connected to a metal part serving as an electrical ground passing electricity to the battery's minus ⊖ terminal. (In this case, the power indicator does not light.)



■ Top view



- **Low pass filter system**
  When this switch is set to ON, this unit can be used as a dedicated low output (sub woofer) power amplifier.
  The knob on the right-hand side adjusts the maximum output frequency (low pass frequency).
  When this system is turned ON, the output of the unit becomes monaural (L + R).

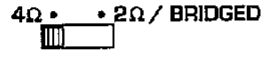


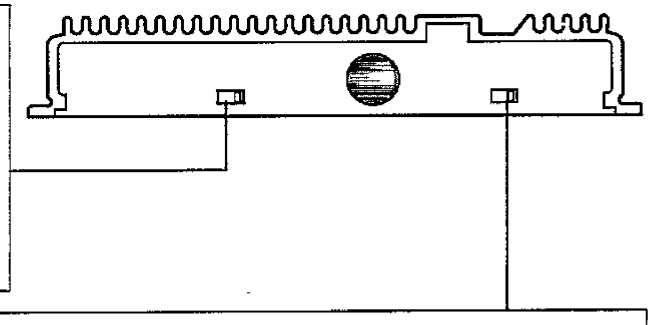
- **Input sensitivity control**
  Adjust this control according to the pre-out level of the center unit connected to this unit.

Center unit preout level	Amplifier input sensitivity
300 mV	MAX
800 ~ 1000 mV	0.3 V

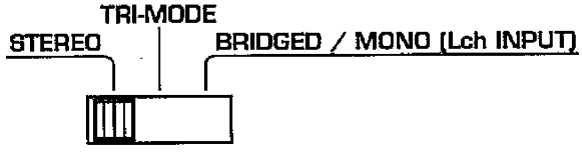
■ Side view

- **Speaker switch**
  When the impedance of connected speakers is 4 Ω, set the switch to the left. When the impedance is 2 Ω or the output is bridge type, set the switch to the right.





- **Operation switch**
  This switch can be used to configure the unit for a wide variety of applications.



STEREO position:
Set to this position to use the unit as a normal stereo amplifier.

TRI-MODE position:
Set to this position to use the unit as a stereo amplifier while at the same time obtaining a bridged output.

BRIDGED/MONO position:
Set to this position to use the unit as a monaural amplifier with a bridged output.

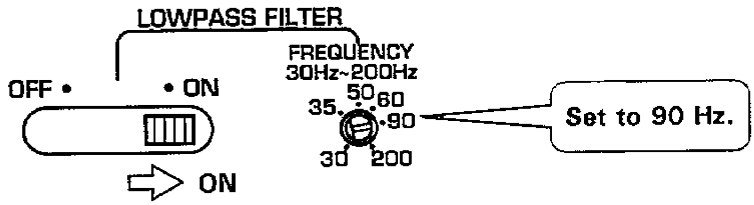
LOW PASS FILTER SYSTEM

■ SYSTEM EXAMPLE

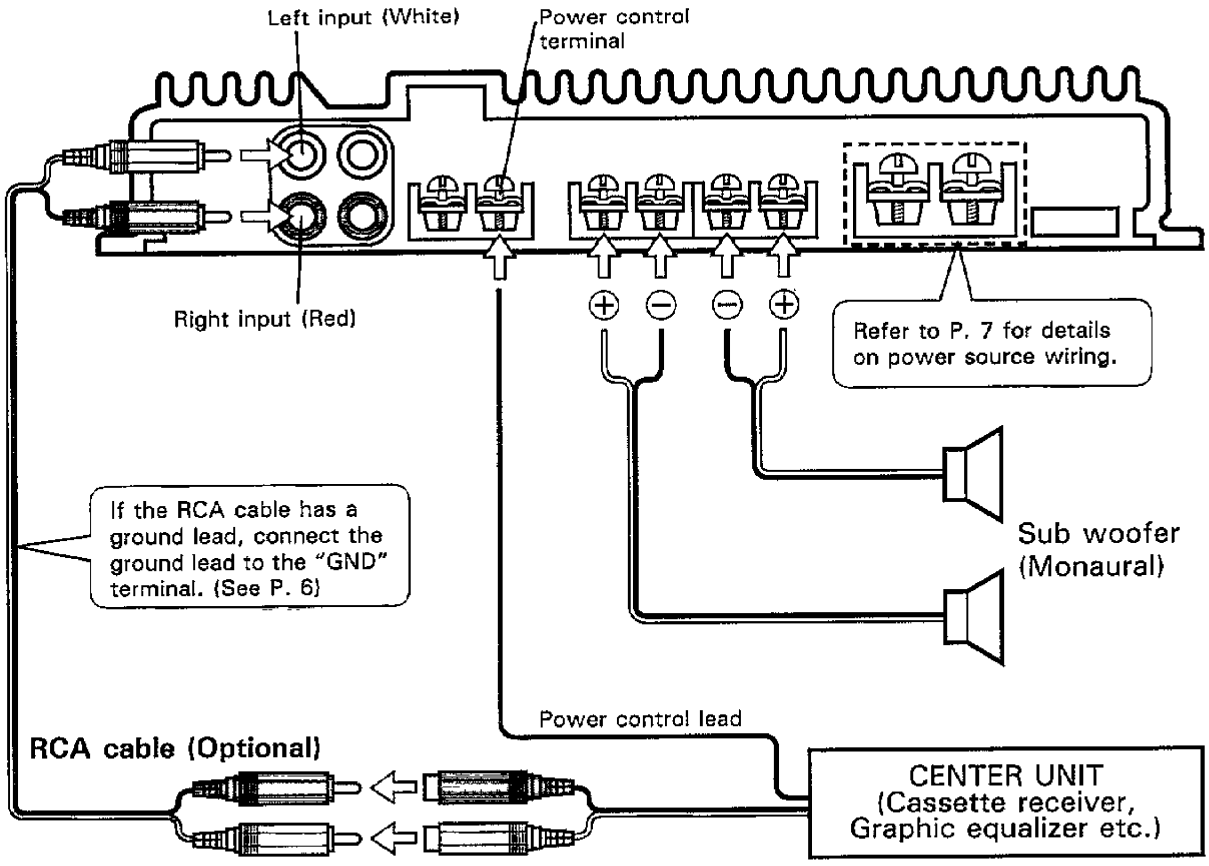
You can use the built-in low pass filter function to configure the following type of system.

- **Sub woofer system for output frequencies of less than 90 Hz.**

<Low pass filter adjustment>

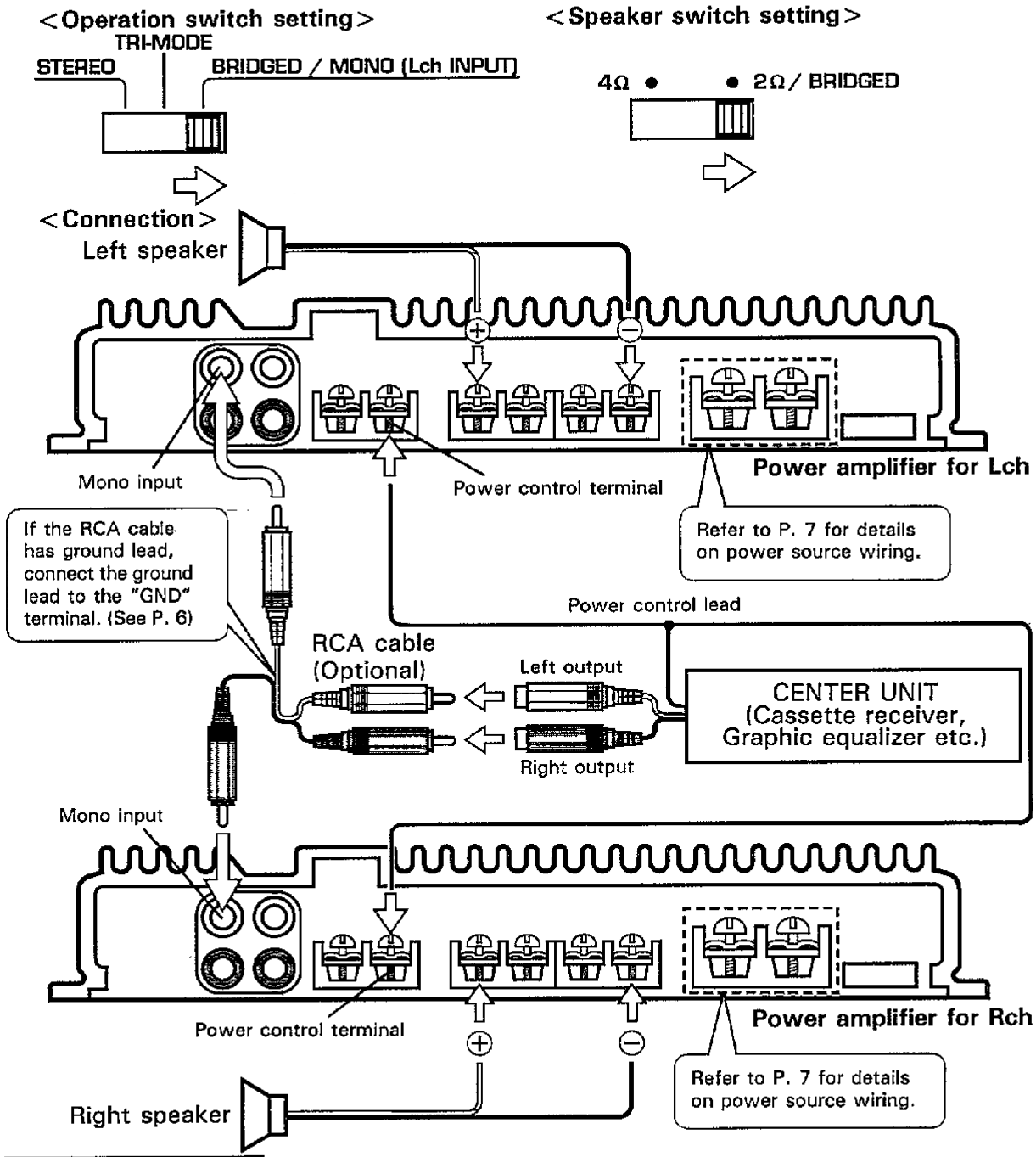


<Connection>


Left input (White)
Power control terminal
Right input (Red)
Refer to P. 7 for details on power source wiring.
If the RCA cable has a ground lead, connect the ground lead to the "GND" terminal. (See P. 6)
Sub woofer (Monaural)
Power control lead
RCA cable (Optional)
CENTER UNIT (Cassette receiver, Graphic equalizer etc.)

■ SYSTEM EXAMPLE

This unit can be used as a monaural amplifier by setting the operation switch to the Bridged/Mono position. This allows you to combine two units to create a high-powered sound system.



⚠ CAUTION

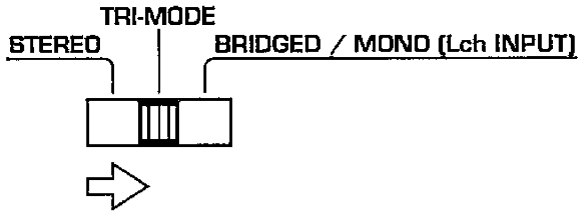
- Be sure that the combined impedance of your speaker system as seen from the KAC-923/823 is at least 2 ohms. An impedance of less than 2 ohms will damage the amplifier.

TRI-MODE

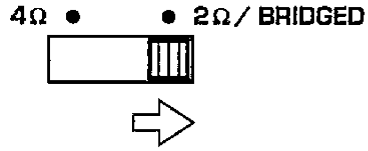
By setting the switch to the Tri-mode position, you can obtain a stereo output and a bridged output at the same time, allowing you to connect both a pair of normal stereo speakers and a woofer.
This setup enables you to use the frequency cut-off characteristics of coils and capacitors (see below) to configure your own multi-way speaker system.

- **Coil (L): Passes low frequencies and blocks high frequencies. (Low pass)**
- **Capacitor (C): Passes high frequencies and blocks low frequencies. (High pass)**

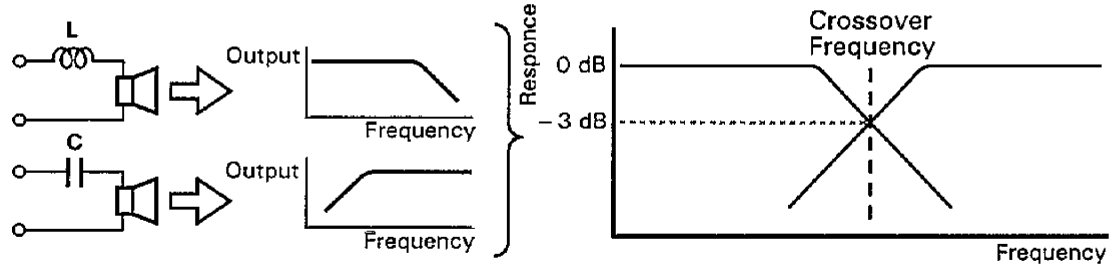
<Operation switch setting>



<Speaker switch setting>



■ 6dB/octave for High and Low pass filter



■ Table of content for 6dB

Cross over frequency	Speaker impedance			
	2 ohm		4 ohm	
	L (Coil)	C (Capacitor)	L (Coil)	C (Capacitor)
80 Hz	4.0 mH	1000 μF	8.0 mH	500 μF
100 Hz	3.2 mH	800 μF	6.4 mH	400 μF
150 Hz	2.1 mH	530 μF	4.2 mH	270 μF
200 Hz	1.6 mH	400 μF	3.2 mH	200 μF

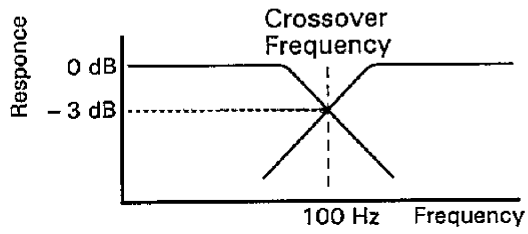
- If the coils and capacitors are not available in the values listed, coils and capacitors with similar or close values can be used without affecting the performance in practical use.
- Coils and capacitors not listed in the above table can be determined using the following formulas.

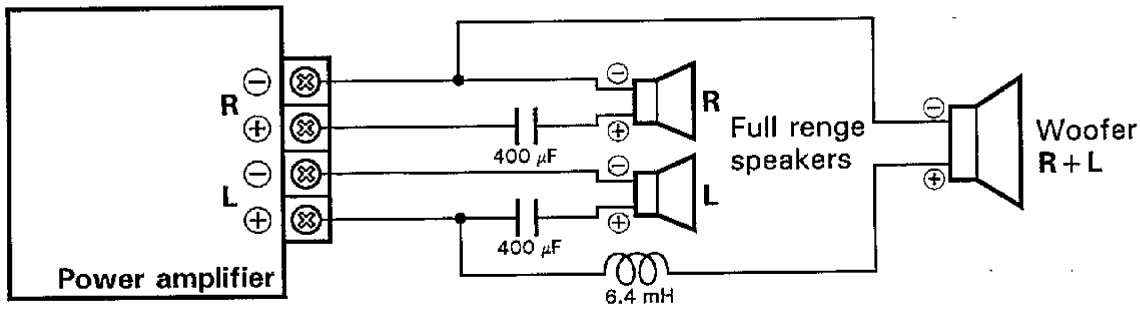
$$C = \frac{159000}{fc \times R}\ (\mu F) \qquad L = \frac{159 \times R}{fc}\ (mH)$$

fc = Cut of Frequency (Hz) R = Speaker Impedance (Ω)

■ SYSTEM EXAMPLE

- 2 way speaker system
- Use 4 ohm speakers.
- 6dB/oct. slope
- Full range speaker:
  100 Hz or more
- Woofer: 100 Hz or less
  From the table on the previous page, the coil and capacitors required for the above system are as follows:
  - Capacitors for full-range speakers : 400 μF (Withstand voltage: 50 V or more)
  - Coil for woofer : 6.4 mH (Current capacity: 5 A or more)





⚠ CAUTION

- Be sure that the combined impedance of your speaker system as seen from the KAC-923/823 is at least 2 ohms. An impedance of less than 2 ohms will damage the amplifier.

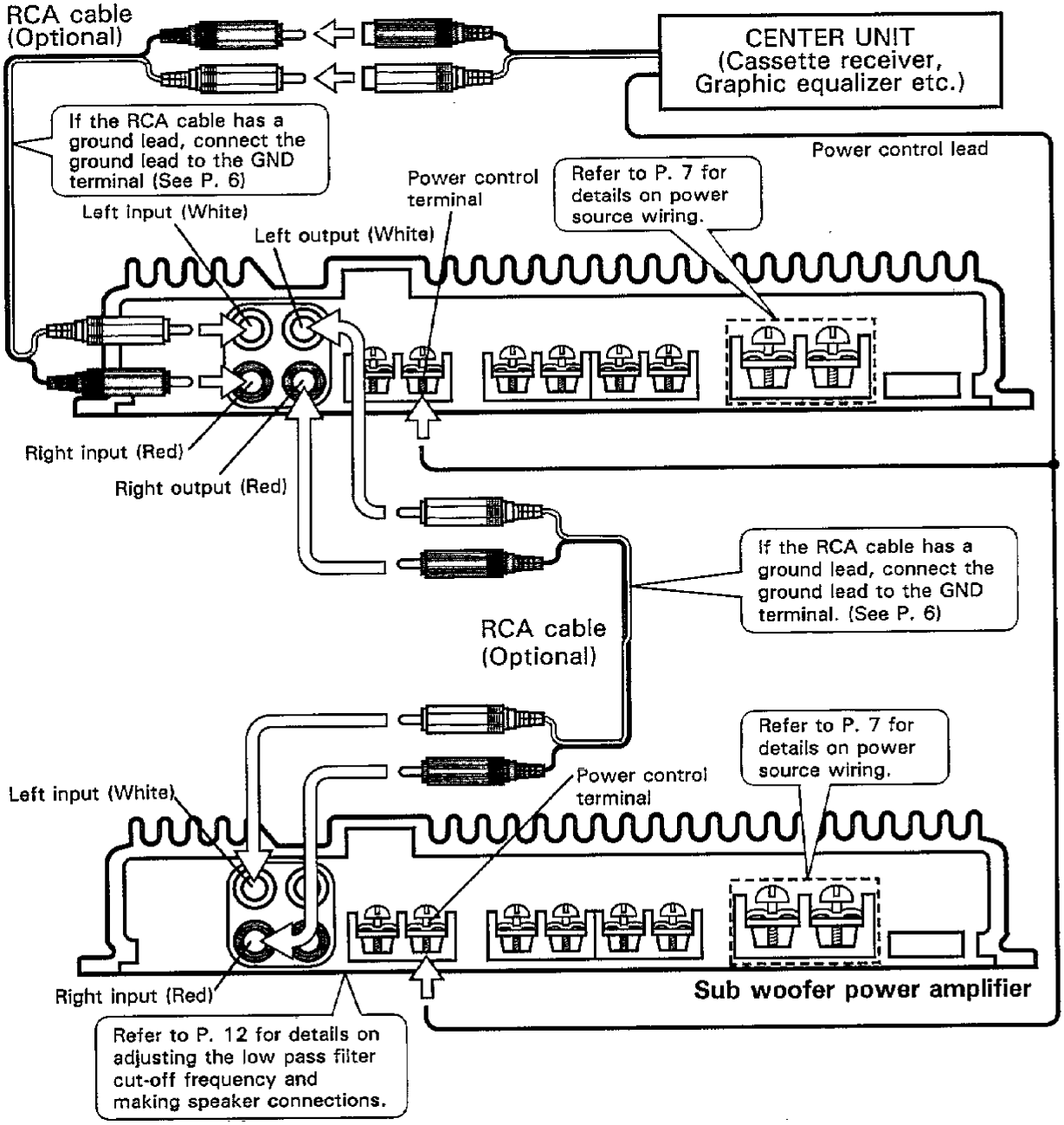
USING THE RCA LINE IN AND OUT TERMINALS

There are times when you may want to add another power amplifier to your system for expansion purposes such as driving a sub woofer. This unit is equipped with a line output which makes it easy to add another power amplifier to your system.

■ SYSTEM EXAMPLE

- Two amplifiers are used in the system, with one used as a normal stereo power amplifier and the other used as a sub woofer power amplifier.

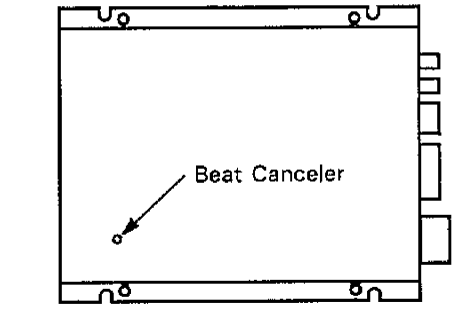
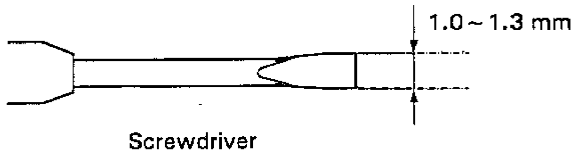
<System connection>


RCA cable
(Optional)
CENTER UNIT
(Cassette receiver,
Graphic equalizer etc.)
If the RCA cable has a ground lead, connect the ground lead to the GND terminal (See P. 6)
Power control lead
Power control terminal
Refer to P. 7 for details on power source wiring.
Left input (White)
Left output (White)
Right input (Red)
Right output (Red)
If the RCA cable has a ground lead, connect the ground lead to the GND terminal. (See P. 6)
RCA cable
(Optional)
Refer to P. 7 for details on power source wiring.
Left input (White)
Power control terminal
Right input (Red)
Sub woofer power amplifier
Refer to P. 12 for details on adjusting the low pass filter cut-off frequency and making speaker connections.

<Refer to P. 7 for details on power lead connections.>

TROUBLESHOOTING GUIDE

What often appears to be a malfunction is often due to user error in operation or connection. When trouble occurs with your unit, please check the following before calling for service.

Symptom	Cause	Remedy
No sound. **(No sound from one side.)**	A speaker cord has become unconnected.	Check the speaker cord connections.
The sound quality is bad. **(The sound is distorted.)**	1. The speakers are connected to the same wires. 2. A speaker cord is pinched by a screw in the car body.	1. Connect each speaker terminal to its respective speaker output. 2. Check the speaker wiring.
Beat noise is heard when listening to AM radio broadcasts.	Use a screwdriver to adjust the "Beat Canceler" on the bottom of the unit.   Screwdriver	

SPECIFICATIONS

Specifications subject to change without notice.

<KAC-923>

[Audio section]

Max Power Output (4 ohm)
Normal ..... 220 W + 220 W
Rated Power Output at 12 V** (4 ohm)
** Normal (20 Hz ~ 20 kHz, less than 0.05% THD) ..... 100 W + 100 W
Bridged (1 kHz, less than 0.3% THD) ..... 270 W
Rated Power Output (2 ohm)
Normal (1 kHz, less than 0.3% THD) ..... 135 W + 135 W
Frequency Response (−3 dB) ..... 2 Hz ~ 45 kHz
Sensitivity (rated output) MAX. ..... 0.15 V
MIN. ..... 3.0 V
Signal to Noise Ratio ..... 105 dB
Input Impedance ..... 10 kΩ
Damping Factor (100 Hz) ..... More than 200
Low Pass Filter Frequency ..... 30 ~ 200 Hz (variable)

[General]

Operating Voltage ..... 12.0 V (11 ~ 16 V allowable)
Current Consumption (MAX.) ..... 30 A
Dimensions (W × H × D) ..... 273 × 56 × 250 mm
(10 × 3/4 × 2-3/16 × 9-13/16 in.)
Weight ..... 4.1 kg (9.0 lb)

<KAC-823>

[Audio section]

Max Power Output (4 ohm)
Normal ..... 160 W + 160 W
Rated Power Output at 12 V** (4 ohm)
** Normal (20 Hz ~ 20 kHz, less than 0.05% THD) ..... 70 W + 70 W
Bridged (1 kHz, less than 0.3% THD) ..... 180 W
Rated Power Output (2 ohm)
Normal (1 kHz, less than 0.3% THD) ..... 90 W + 90 W
Frequency Response (−3 dB) ..... 2 Hz ~ 45 kHz
Sensitivity (rated output) MAX. ..... 0.15 V
MIN. ..... 3.0 V
Signal to Noise Ratio ..... 105 dB
Input Impedance ..... 10 kΩ
Damping Factor (100 Hz) ..... More than 200
Low Pass Filter Frequency ..... 30 ~ 200 Hz (variable)

[General]

Operating Voltage ..... 12.0 V (11 ~ 16 V allowable)
Current Consumption (MAX.) ..... 25 A
Dimensions (W × H × D) ..... 273 × 56 × 220 mm
(10 × 3/4 × 2-3/16 × 8-11/16 in.)
Weight ..... 3.7 kg (8.2 lb)